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## Document Number 1

Entry 1 of 1

File: JPAB

Jun 18, 1981

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DOCUMENT-IDENTIFIER: JP 56073579 A

TITLE: PRODUCTION OF COATED OBJECT

PUBN-DATE: June 18, 1981

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APPL-NO: JP54149792

APPL-DATE: November 19, 1979

INT-CL (IPC): B05D 7/04; G03C 1/74

## ABSTRACT:

PURPOSE: To prevent the clogging of nozzle tip despite long-time coating by ejecting liquid from the central part of a suction nozzle which sucks coating liquid to the coated thick film part and sucking this liquid together with the coating liquid of the coated thick film part.

CONSTITUTION: An opening 2 for suction is diametrally opposed to the thick film part 11 at the edge of the coated matter coated on a substrate 12 and a suction nozzle 1b is fixed to the position in contact with the coating liquid, thence the rear end of a liquid ejection nozzle 4 and the storage vessel for the liquid to be supplied are connected to the discharge port of a pump by means of conduit. An opening 3 for discharge is connected to a pressure reducing device. When the liquid is sucked from the opening 3 for discharge while warm water is being supplied to the nozzle 4, the coating liquid of the thick film part 11 of the coated part moving just before the opening 2 for suction is sucked together with the warm water which is being ejected, through the opening 2 for suction, whereby the coating liquid of the thick film part 11 of the coated edge is removed. It is equally well to connect the nozzle 4 simply to a warm water tank by means of a conduit.

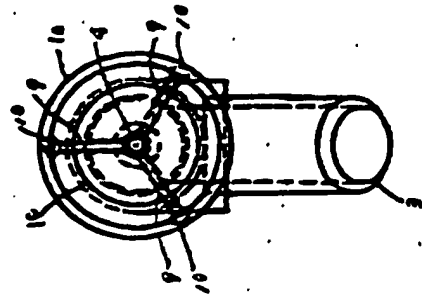
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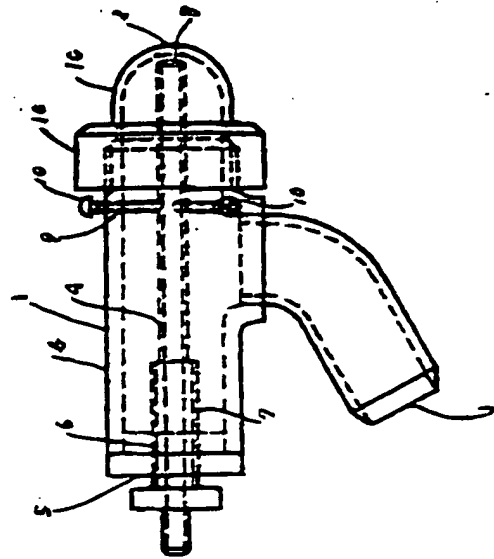
Iの先端部 II---厚底部

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第2図

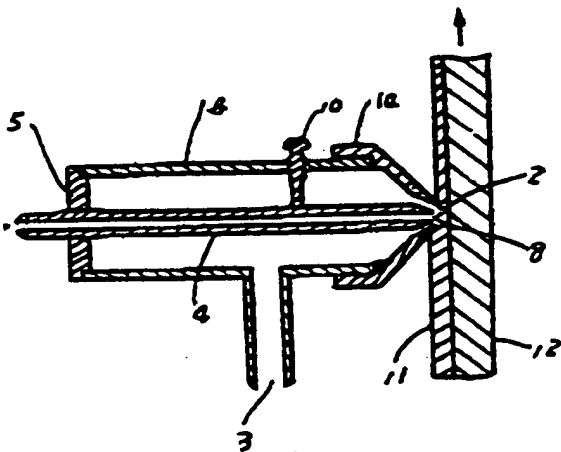


第1図



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第3図



第1頁の続き

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⑤ 特許出願公開

## ⑥ 公開特許公報 (A)

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⑧ 公開 昭和56年(1981)6月18日

発明の数 1

審査請求 未請求

(全 3 頁)

## ⑨ 塗布物の製造方法

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⑩ 特 願 昭54-149792

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⑫ 出 願 昭54(1979)11月19日

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## 明 細 書

## 1. 発明の名称

塗布物の製造方法

## 2. 特許請求の範囲

被塗布物に塗布液を塗布して塗布層をつくり、  
該塗布層が乾燥する前に該塗布層の縁から塗布液  
を吸取り、次いで上記の塗布層を乾燥させる塗布  
物の製造方法において、塗布液を吸取る吸引ノズ  
ルの中央部から流体を塗布厚縁部に噴出させ、こ  
の流体と塗布厚縁部の塗布液とを併せて吸引ノズ  
ルに吸引することを特徴とする塗布物の製造方法。

## 3. 発明の詳細な説明

本発明は、塗布物の製造方法に関するもので  
ある。

一般に、写真フィルムベース等の被塗布物に塗  
布液を塗布すると表面張力の影響で縁の肥厚した  
塗布層ができる。この肥厚した縁の存在は、塗布  
層全体の乾燥を著しく遅らせる。このため過大な  
乾燥能力が必要となる。また、この縁を十分に乾  
燥させないで未乾燥の状態で搬送すると、縁の塗

布液が搬送ローラに付着して割れたり、また、こ  
の縁が十分に乾燥しないうちに塗布物をローラに  
巻取ると、縁が先行部に付着して後の搬送工程で  
巻きはくする場合塗布物が切れる等の故障が発生す  
る。

これらの不都合を無くす手段として、被塗布物  
の両端に蒸気を吹き付けながら被塗布面を覆らし、  
塗布液を蒸気せしめて乾燥を行なう方法や、塗布  
層の縁のみに通常の乾燥とは別に加熱空気を吹き  
付けて強制的に乾燥させる方法等が知られている。  
しかしながら、これらの方法には大変かりな装置  
が必要とされ、またその操作は非常に面倒である。

このような不都合、不便をなくす技術として、  
低圧ジャケットを有する塗布液吸取用パイプ（吸  
引ノズル）により、塗布層の縁部の塗布液を吸取  
る方法が特公開 52-38407 号公報によって知られ  
ている。しかし、かかる装置によっては長時間に  
わたる塗布作業の場合に塗布液吸取用パイプのノ  
ズル先端が塗布液の固着によって詰まることが多  
く、十分な性能を発揮しえない問題の生ずること

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が判明した。

従って、本発明の目的は長時間の塗布においても塗布物の固着によってノズル先端の詰まりを生じない塗布装置の厚膜部の塗布液を除去する方法を提供することである。

本発明の目的は、被塗布物に塗布液を塗布して塗布層をつくり、該塗布層が乾燥する前に該塗布層の端から塗布液を吸取り、次いで上記の塗布層を乾燥させる塗布物の製造方法において、塗布液を吸取る吸引ノズルの中央部から液体を塗布厚膜部に吐出させ、この液体と塗布厚膜部の塗布液とを併せて吸引ノズルに吸引することによって達成される。

本発明の詳述を実施例について図面により説明する。

第1図および第2図において、吸引ノズル1は吸引用開口2をその一端に、排液用開口3をその他端に有し、その内部に液体吐出ノズル4を吸引ノズル1の底面壁部5に設けた雌ねじ6に液体吐出ノズルの外側壁部7に設けた雄ねじ7を嵌合

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第3図に示すように被塗布物12に塗布された塗布物の最の厚膜部11に吸引用開口2が正対しかつ塗布液と接触しうる位置に本発明の吸引ノズルを固定し、液体吐出ノズル4の従動と供給すべき液体貯蔵容器とをポンプの吐出口に導管で接続し、排液用開口3を減圧装置に接続する。このように配管して、液体吐出ノズル4に温水を送りつつ排液用開口から吸引すれば、吸引用開口2の直直を移動する塗布部の厚膜部の塗布液が液体吐出ノズル4から吐出する温水と共に吸引用開口2から吸引され、塗布最の厚膜部の塗布液が除去される。液体吐出ノズルは、ポンプの吐出口に接続せず単に温水槽に導管で接続するだけでもある程度の流量は保たれる。

この装置の条件は実験により容易に求めることができるが、一例を示せば下記の通りである。

排液用開口の直径	3.5 mm φ
排液用開口部の圧力	-900 mm/Aq
液体吐出孔の直径	4 mm φ
液体吐出ノズルからの吐出流量	200 cc/min

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させ吸引ノズル1に対して液体吐出ノズル4を回転させることによって吸引用開口部2と液体吐出ノズル4の液体吐出孔8との間隔を任意に調節しうるようにしている。吸引部の側壁には3個の雌ねじ孔9を設け、これらに嵌設した3個の調整ビス10を組合わせて調整ビス10の一端を液体吐出ノズル4の外壁に圧着させ、3個の調整ビス10の各々を回転させるとその軸方向に移動し、吸引用開口2と液体吐出ノズル4の液体吐出孔8との相対的位置を調節しうるようにしている。液体吐出ノズル4の液体吐出孔8の反対側の先端部は温水を導くパイプと接続しうるようにしてある。吸引ノズル1の先端部1aは吸引ノズル1の本体1bと組合により着脱可能となっており、先端部1bのドーム壁部1cは内部の監視に都合のよいように透明材料でできている。

次に、塗布層をゲル化して乾燥させるセラチンを含む構成層を有する感光材料を製造する場合にこの装置を適用する方法について説明する。

塗布液を塗布後、乾燥工程前の工程において、

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吸引用開口2の先端と

被塗布物との間隔 180 μ

液体吐出孔10の外壁と吸引ノズル

1のドーム壁部の内壁との間隔 1.5 ~ 2 mm

本発明に係る厚膜除去装置は、塗布液からの溶媒の蒸発や塗布液の冷却によるゲル化等によって固化する塗布液を塗布した厚膜部の塗布液を除去する際に吸引用開口に目詰りの発生がなく長時間安定した作業を可能にする利点を有する。

#### 4. 図面の簡単な説明

第1図は本発明に係る厚膜除去装置の実施例の正面図、第2図は第1図に示した装置の側面図である。第3図は塗布物との関係位置を横断面図で示した説明図である。

- 1 --- 吸引ノズル      1b --- 吸引ノズル1の本体  
1c --- 吸引ノズル1のドーム壁部      2 --- 吸引用開口  
3 --- 排液用開口      4 --- 液体吐出ノズル  
5 --- 吸引ノズル1の底面壁部      6 --- 雌ねじ  
7 --- 雄ねじ      8 --- 液体吐出孔  
9 --- 雌ねじ孔      10 --- 調整ビス

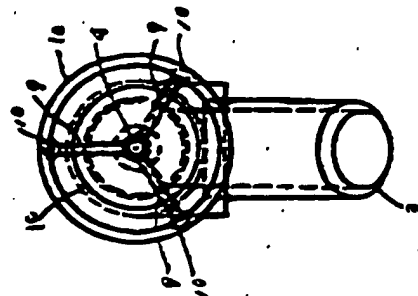
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1a ---- 吸引ノズル 1 の先端部    11 ---- 厚底部  
12 ---- 被塗布物

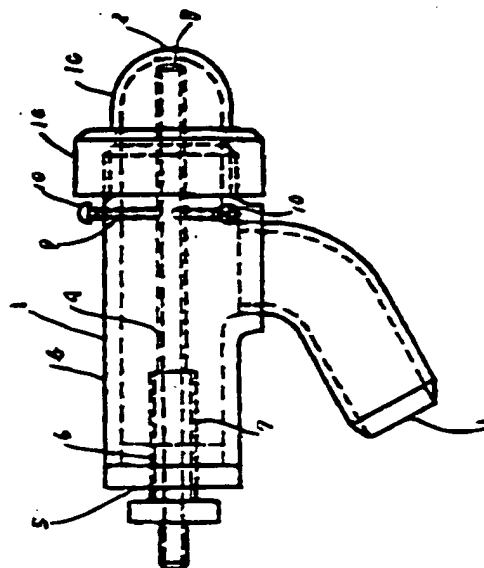
代理人 島 原 義 美

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第2図

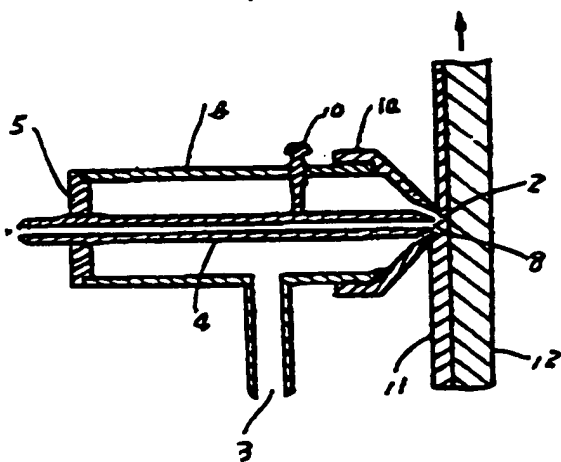


第1図



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第3図



第1頁の続き

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(43) Released: 6/18/81

(51) Int. Cl.<sup>3</sup> ID symbol Agency Control No.

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(54) Method of Fabricating Coatings

(21) Patent application: 54(1979)-149792

(22) Applied for: 11/19/1979

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(74) Agent: Yoshimi Kuwahara, Patent attorney

## Specifications

1. **Name of Invention:** Method of Fabricating Coatings

2. **Scope of Patent Application:** In a method of fabricating coating material by spreading a coating liquid on a substance to be coated to make a coating layer, suctioning the coating liquid from the edges?? of the said coated layer while the said coating layer is drying and then drying the above coating layer, a method of making a coating substance characterized by spraying a liquid onto the thickly coated part from the center of a suction nozzle that suctions off the coating liquid, combining this liquid with the coating solution of the coated thick area and drawing it into a suction nozzle.

3. **Detailed Explanation of Invention**

This invention is one bearing on a method of manufacturing a coating.

Generally, when a coating liquid is applied to a substance to be coated such as photo film base, etc., a thickened coating layer forms at the edges?? due to the effects of surface elasticity. The presence of these thickened edges?? markedly delays drying of the coated layer overall. Because of this, excessive drying strength is required. And, if one leaves these edges?? in an inadequately dried condition, the edge's coating liquid will stick to the xxxx rollers and be damaged. Or, if these edges?? feed onto the roller while inadequately dried, the edges?? will stick to the forward parts, giving rise to such damage as the coated material tearing when unwound in later manufacturing processes.

Known ways to eliminate such damage are the approach of doing coating by applying the coating liquid while exposing the surface to be coated to a spray of steam at both edges of the material being coated, and the method of forced drying by blowing heated air only on the edges?? of the coated layer in addition to normal drying. But, such methods need elaborate equipment and are quite troublesome to operate.

A way to eliminate such difficulties, known from Patent Release 52-38407, is using a liquid-suctioning bib (suction nozzle) which has an insulating jacket and suctioning the coating liquid at the edges?? of the coating layer. Yet, it has been found that with such a device the end of the bib's nozzle often becomes clogged with coating solution that adheres to it when applying coating for an extended time, so that it cannot adequately function.

So, the purpose of this invention is to provide a method to make a coating layer on the thick part of the coated edges?? which does not clog the nozzle end during long coating times due to coating solution adhering.

In a fabricating method for a coating material whereby one applies a coating solution to material to be coated to form a coating layer, suctions-up coating solution from the sides?? of the said coating layer in a xxxx which the said coating layer xxxxs, and then xxxxs the above-coating-layer, the goal of this invention is achieved by spraying a liquid onto the edges?? of a coating layer from the center of a suction nozzle that suctions up coating solution, and by suctioning with this nozzle both this liquid and the coating solution of the coating layer xxxx.

We explain the details of this invention with the figures for the application example.

In Figures 1 and 2 suction nozzle 1 has suction port 2 on one end and liquid-extraction port 3 on the side. Inside, it is made so that xxxx screw 7 installed close to external liquid xxxx of liquid-spray nozzle by xxxx screw 6 which holds liquid spray nozzle 4 at the xxxx part 5 of suction nozzle 1 is xxxxed; and by having liquid-spray nozzle 4 rotate with respect to suction nozzle 1, one can voluntarily control the spacing of suction port 2 and liquid spray port 3 of liquid spray nozzle 4.

On the suction nozzle's side are three xxxx screw holes 9. One xxxxs xxxx bolts 10 in these to firmly attach one end of xxxx bolts 10 to the outside of liquid-spray nozzle 4. When one turns each of the three xxxx bolts 10, they move in the direction of their axis so that one can shift their position vis-a-vis suction port 2 and liquid-spray nozzle 4's liquid-spray port 3. The opposite end of liquid-spray nozzle 4's liquid-spray port 3 is made so to be attachable?? to the bib that guides liquids. Suction nozzle 1's end 1a is made so to be attachable?? to suction nozzle 1's main body 1b. Dome part 1c of end 1b is made of a transparent material to facilitate inspections.

Next, we will explain how to apply this device when one applies a coating material having composite layers including a gelatin that gels the coating layer and dries it.

After applying a coating liquid in the xxxx xxxx process, suction port 2 is set immediately opposite thick part 11 of material to which coating 12 has been applied as shown in Figure 3, fixing this invention's suction nozzle in a position where it can contact the coating solution. It connects liquid-spray nozzle 4's xxxx end and liquid-storage vat to the pump's exhaust port via a pipe and connects liquid-extraction port 3 to a hydraulic device. With this arrangement if suctioning is done through the liquid-extraction port while sending warm water to liquid-spray nozzle 4, the coating solution of the thickly coated part that moves the xxxx of suction port 2 will be suctioned from suction port 2 with the warm water sprayed from liquid-spray nozzle 3; and the coating solution of the coated part's thick area will be removed. The liquid-spray nozzle, not being?? attached to the pump's exhaust port, is fed enough water merely by being connected by the piping to a warm-water vat.



The conditions of this xxxx can be easily found by experiments, but were as follows for this example:

Diameter of liquid-extraction port	5.5 mm $\phi$
Pressure at liquid-extraction port	-900 mm/Aq ??
Diameter of liquid-extraction hole	4 mm $\phi$
Liquid volume through spray nozzle	200cc/min
Gap between suction port 2's tip & substance to be coated	180 $\mu$
Gap between spray port 10's outer wall & inner wall of suction nozzle 10's dome	1.5-2 mm

The coating removal?? device made with this invention has the advantage of making stable. extended operation possible without gumming up the suction port when removing thick coating solution through having applied a coating liquid easily hardened by gelling, etc., by evaporating xxxx from the coating liquid or by chilling.

#### 4. Simple Explanation of Figures

Figure 1 is a plane diagram of an application example of the thick xxxx removal device of this invention.

Figure 2 is a cross-sectional diagram of the device shown in Figure 1.

Figure 3 is a diagram illustrating in cross section the position relative to the coating substance.

##### [Keying numbers]

1 .. Suction nozzle	6 .. xxxx screw
1a .. Suction nozzle 1's tip	7 .. xxxx screw
1b ,, Body of suction nozzle	8 .. Liquid spray port
1c .. Dome of suction nozzle	9 .. xxxx screw hole
2 .. Suction port	10 .. xxxx bolt
3 .. Liquid-extraction port	11 .. Thick xxxx part
4 .. Liquid-spray nozzle	12 .. Surface to be coated
5 .. Suction nozzle 1's rear surface	

Agent: Yoshimi Kuwahara

(Translation)

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A way to eliminate such difficulties, known from Patent Release 52-38407, is using a liquid-suctioning bib (suction nozzle) which has an insulating jacket and suctioning the coating liquid at the edges?? of the coating layer. Yet, it has been found that with such a device the end of the bib's nozzle often becomes clogged with coating solution that adheres to it when applying coating for an extended time, so that it cannot adequately function.

So, the purpose of this invention is to provide a method to make a coating layer on the thick part of the coated edges?? which does not clog the nozzle end during long coating times due to coating solution adhering.

In a fabricating method for a coating material whereby one applies a coating solution to material to be coated to form a coating layer, suction up coating solution from the sides?? of the said coating layer in a xxxx which the said coating layer xxxxs, and then xxxxs the above coating layer, the goal of this invention is achieved by spraying a liquid onto the edges?? of a coating layer from the center of a suction nozzle that suction up coating solution, and by suctioning with this nozzle both this liquid and the coating solution of the coating layer xxxx.

We explain the details of this invention with the figures for the application example.

In Figures 1 and 2 suction nozzle 1 has suction port 2 on one end and liquid-extraction port 3 on the side. Inside, it is made so that xxxx screw 7 installed close to external liquid xxxx of liquid-spray nozzle by xxxx screw 6 which holds liquid spray nozzle 4 at the xxxx part 5 of suction nozzle 1 is xxxxed; and by having liquid-spray nozzle 4 rotate with respect to suction nozzle 1, one can voluntarily control the spacing of suction port 2 and liquid spray port 3 of liquid spray nozzle 4.

On the suction nozzle's side are three xxxx screw holes 9. One xxxxs xxxx bolts 10 in these to firmly attach one end of xxxx bolts 10 to the outside of liquid-spray nozzle 4. When one turns each of the three xxxx bolts 10, they move in the direction of their axis so that one can shift their position vis-a-vis suction port 2 and liquid-spray nozzle 4's liquid-spray port 3. The opposite end of liquid-spray nozzle 4's liquid-spray port 3 is made so to be attachable?? to the bib that guides liquids. Suction nozzle 1's end 1a is made so to be attachable?? to suction nozzle 1's main body 1b. Dome part 1c of end 1b is made of a transparent material to facilitate inspections.

Next, we will explain how to apply this device when one applies a coating material having composite layers including a gelatin that gels the coating layer and dries it.

After applying a coating liquid in the xxxx xxxx process, suction port 2 is set immediately opposite thick part 11 of material to which coating 12 has been applied as shown in Figure 3, fixing this invention's suction nozzle in a position where it can contact the coating solution. It connects liquid-spray nozzle 4's xxxx end and liquid-storage vat to the pump's exhaust port via a pipe and connects liquid-extraction port 3 to a hydraulic device. With this arrangement if suctioning is done through the liquid-extraction port while sending warm water to liquid-spray nozzle 4, the coating solution of the thickly coated part that moves the xxxx of suction port 2 will be suctioned from suction port 2 with the warm water sprayed from liquid-spray nozzle 3; and the coating solution of the coated part's thick area will be removed. The liquid-spray nozzle, not being?? attached to the pump's exhaust port, is fed enough water merely by being connected by the piping to a warm-water vat.

The conditions of this xxxx can easily be found by experiments, but were as follows for this example:

Diameter of liquid-extraction port	5.5mm $\phi$
Pressure at liquid-extraction port	-900mm/Aq[??]
Diameter of liquid-extraction hole	4mm $\phi$
Liquid volume through spray nozzle	200cc/min
Gap between duction port 2's tip and substance to be coated	180 $\mu$
Gap between spray port 10's outer wall & inner wall of suction nozzle 10's dome	1.5~2mm

The coating [??] removal device made with this invention has the advantage of making stable, extended operation possible without gumming up the suction port when removing thick coating solutions through having applied a coating liquid easily hardened by gelling, etc., by evaporating xxxx from the coating liquid or by chilling.

#### 4. Simple Explanation of Figures

Figure 1 is a plane diagram of an application example of the thick xxxx removal device of this invention.

Figure 2 is a cross-sectional diagram of the device shown in Figure 1.

Figure 3 is a diagram illustrating in cross section the position relative to the coating substance.

[Keying symbols]

1 .. Suction nozzle	6 .. xxxx screw
1a .. Suction nozzle 1's tip	7 .. xxxx screw
1b .. Body of suction nozzle	8 .. Liquid spray port
1c .. Dome of suction nozzle	9 .. xxxx screw hole
2 .. Suction port	10 .. xxxx bolt
3 .. Liquid-extraction port	11 .. Thick xxxx part
4 .. Liquid-spray nozzle	12 .. Substance to be coated
5 .. Suction nozzle 1's rear surface	

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December 4, 2000

TO: Mr. Charles Brantley  
MICRON Technology  
Boise, Idaho

RE: Our phone conversations this morning

Accompanying this is my English translation of Japanese Patent Release JP 56-73579 with the corrected fourth page, as you requested.

You will have noted that this patent copy was another "black blob" copy--many characters in the text so poorly copied that they have become black blobs. Over the years, I have had good cooperation from your Patent Division in getting the clearest possible copy to work with, but this was apparently one time when good copy simply was not available.

As you may know, the number of different characters used in such technical writing is upwards of 4,000 to 5,000. Small internal differences between characters totally change their meaning. So, in dealing with black-blob or too faint copy, a translator can only get so far by examining the context of the character or its general external shape.

I do not know what action the U.S. Patent Office can take; but, after translating in the past decade some two hundred Japanese patents, of which perhaps 10-15% were poor copy like this, I feel the Japanese Patent Office must, under international treaties and agreements, have a responsibility to do a better job of providing clear copy.

*Hugh Burleson*